Development and Flight Test of In Situ Turbulence Algorithms

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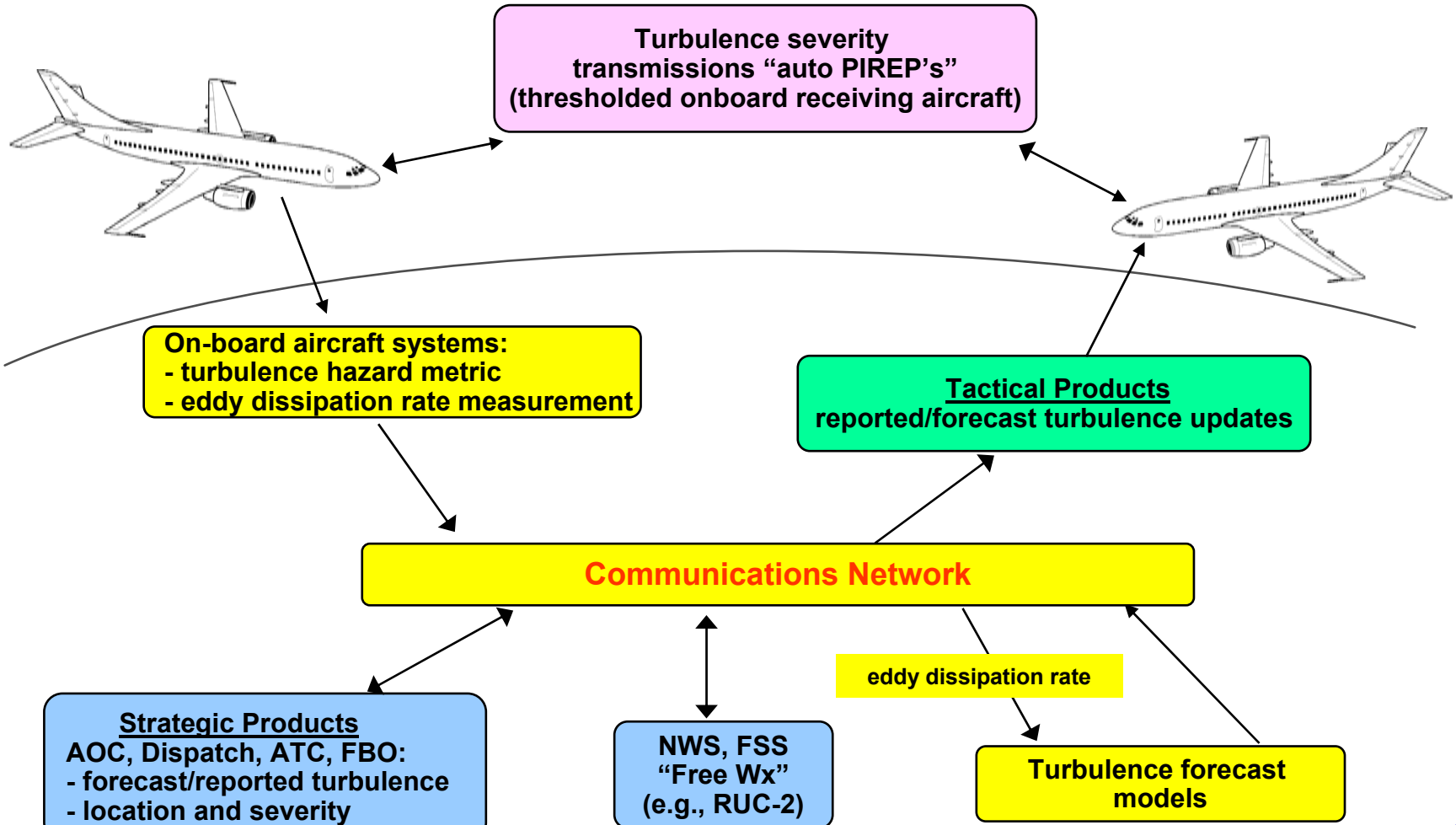
2nd Weather Accident Prevention Annual Project Review
Cleveland, OH, June 5-7, 2001

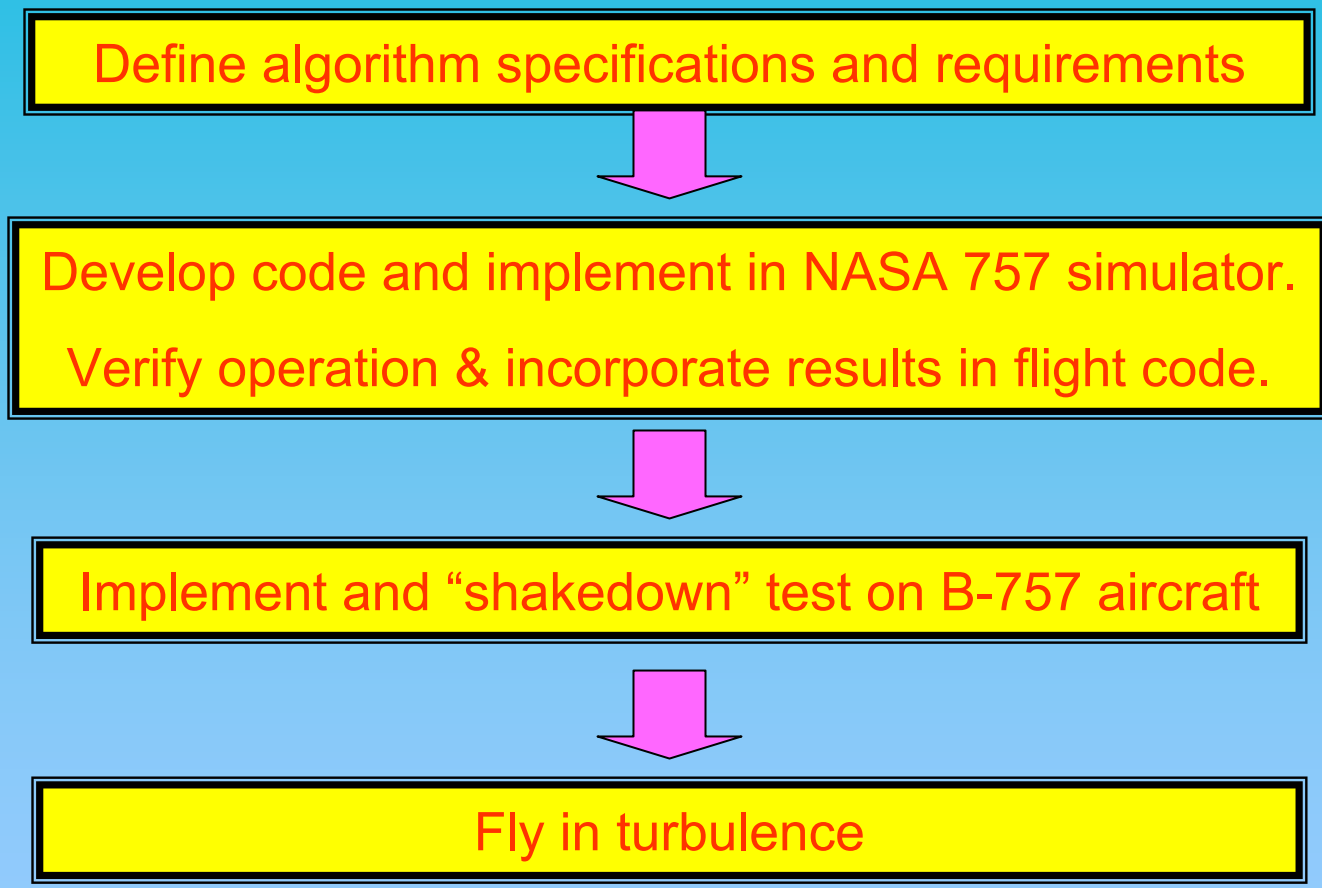
In Situ Turbulence Product Integration in Communications Infrastructure



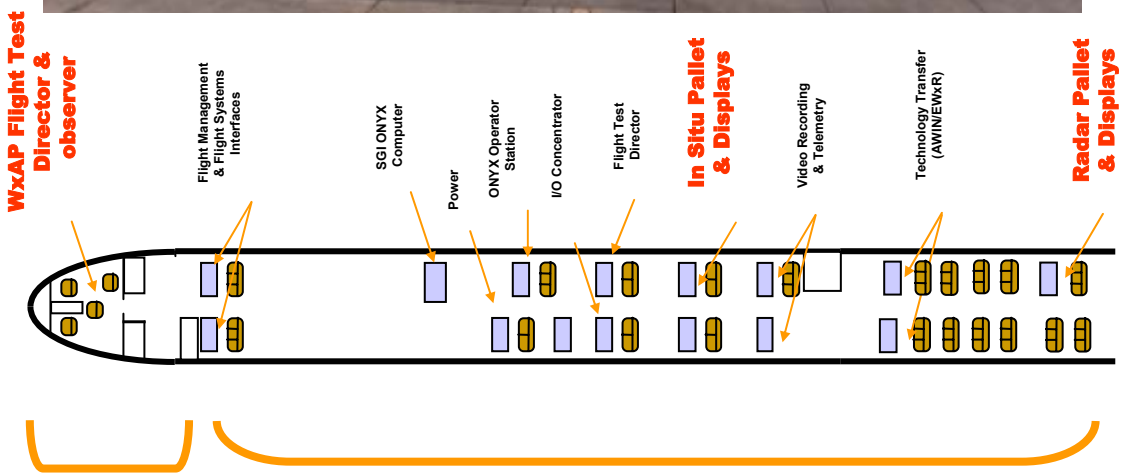
AeroTech's Task Areas

- **Develop, implement, and test in situ algorithms on NASA B-757 Research Aircraft:**
  - **3-D wind & turbulence recovery**
  - **atmospheric/meteorological diagnostics**
  - **distributed load analysis**
  - **hazard metric for radar**
- **Data analysis of flight test data**
- **Support radar algorithm development**

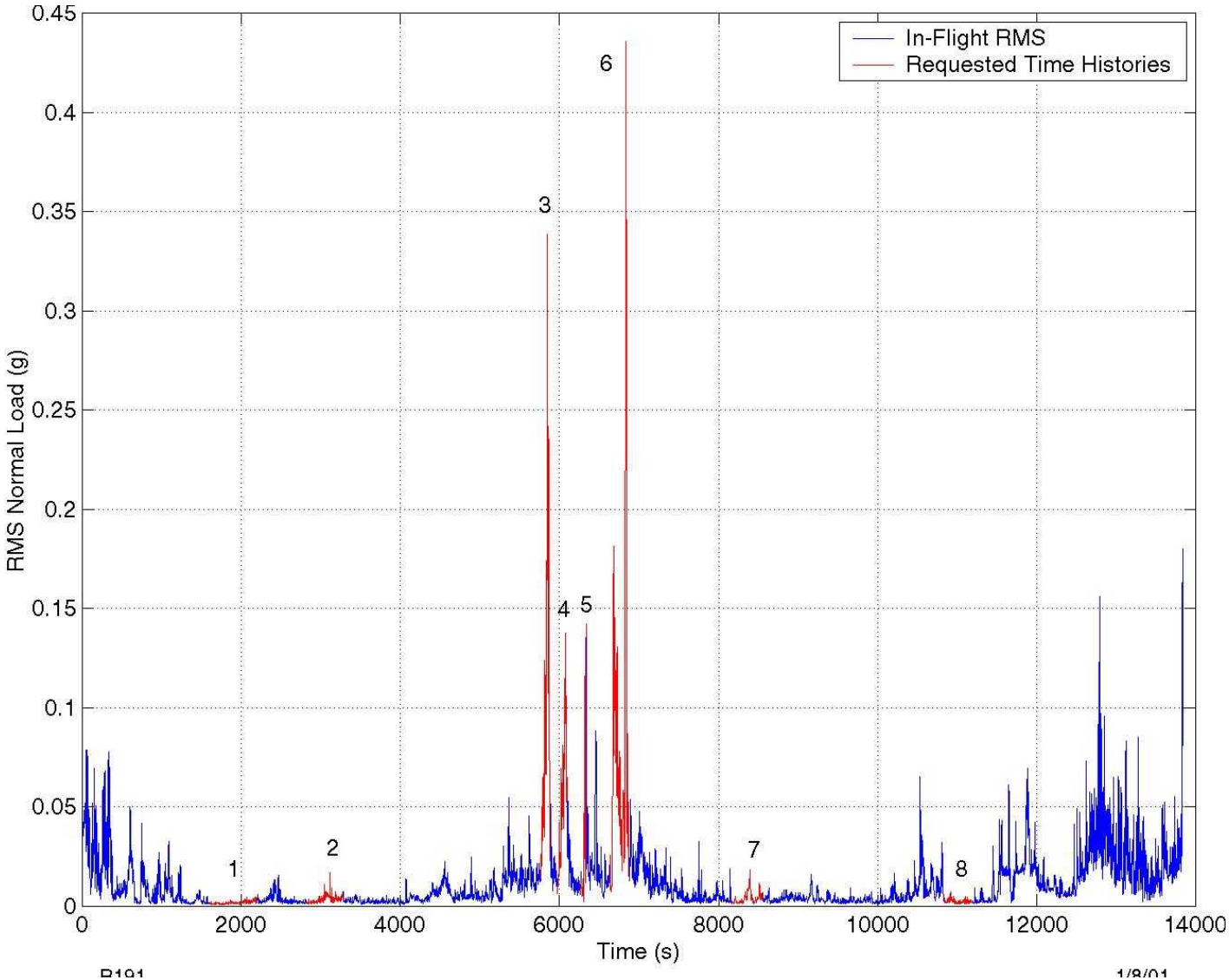
Algorithm Development Process



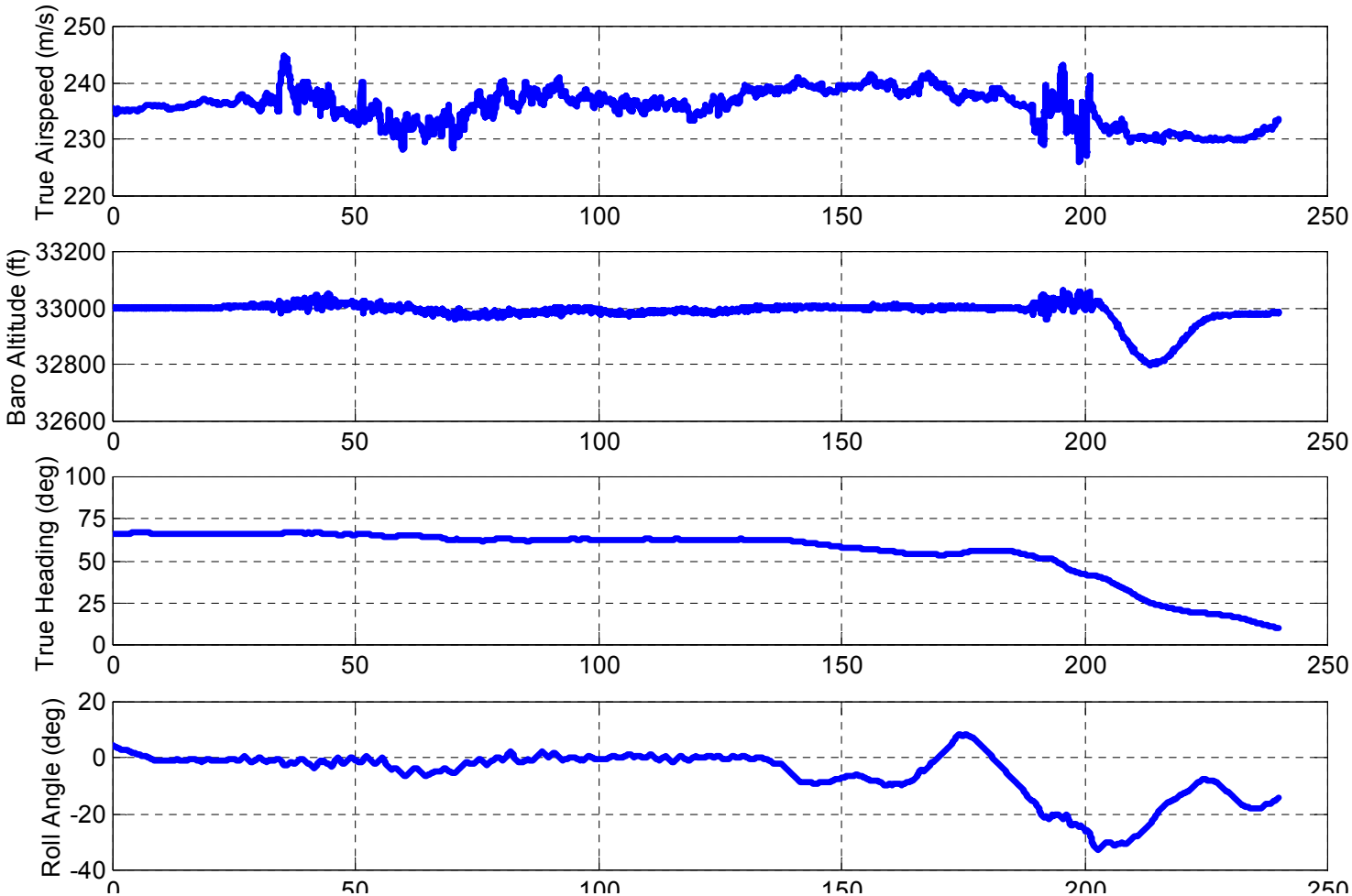
NASA B-757 Turbulence Flight Experiment Setup



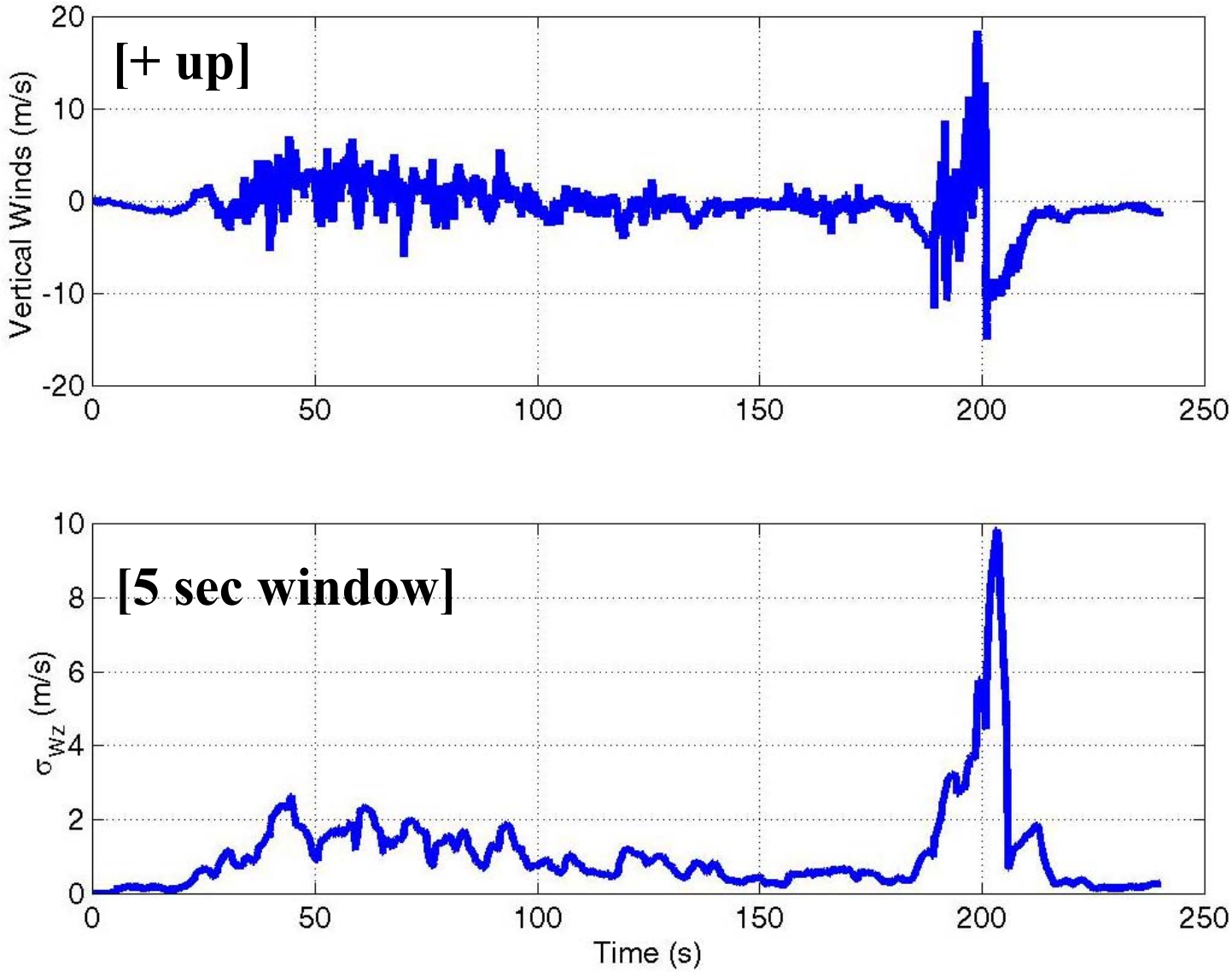
RMS Normal Load - Flight 191



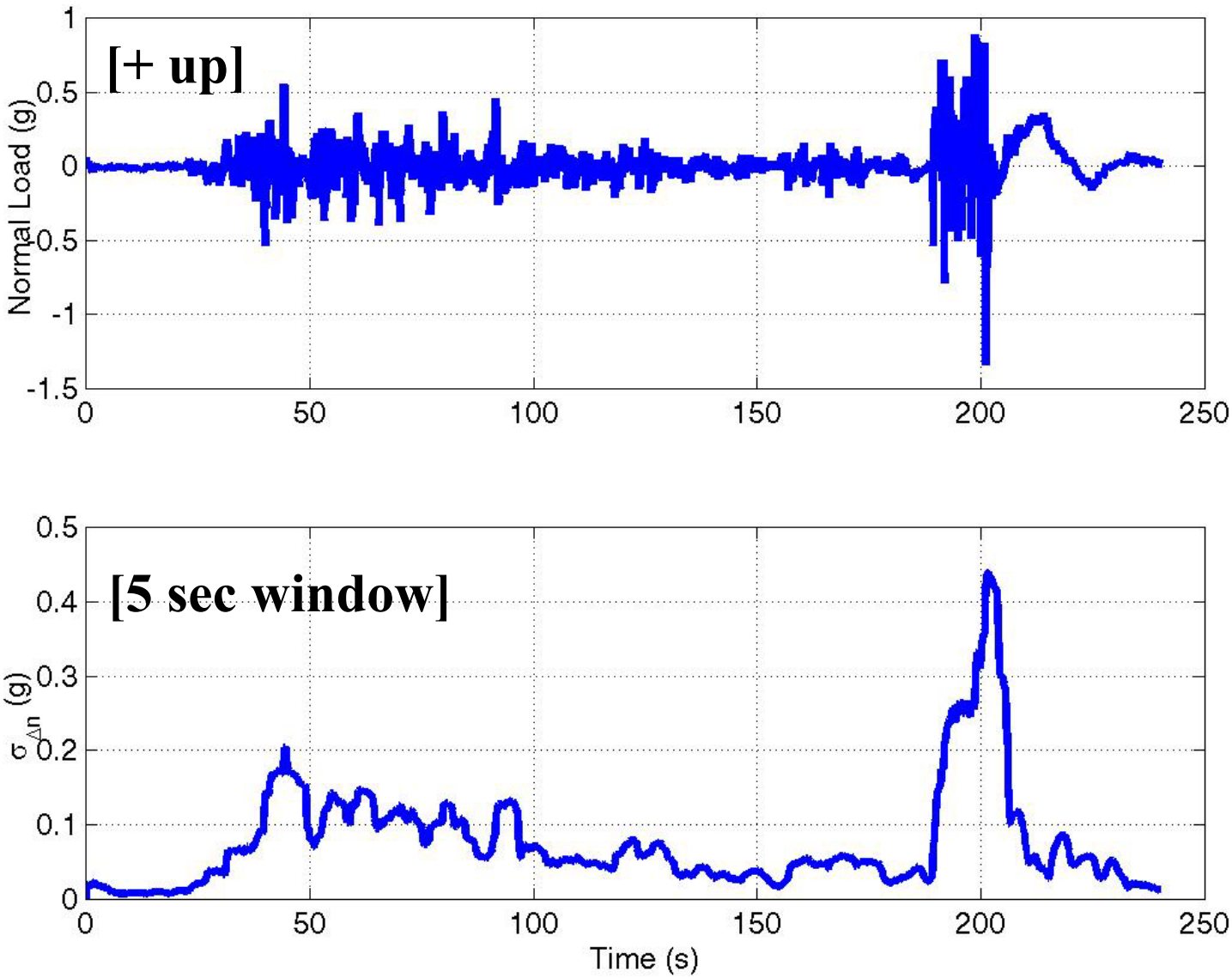
Flight Conditions: *R191-06*



Vertical Gust and R.M.S. Vertical Gust (σ_{Wg})

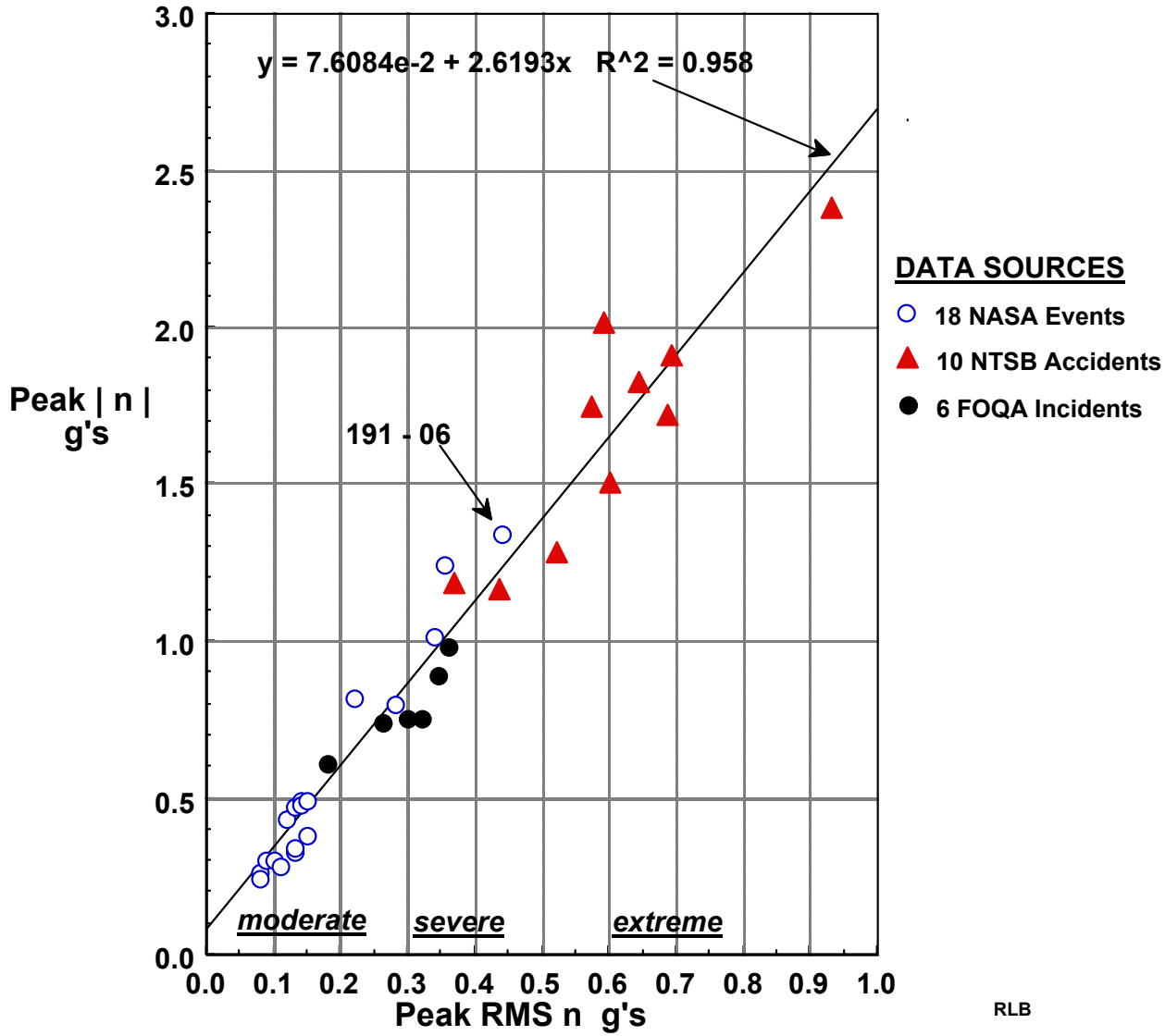


Normal Load and R.M.S. Normal Load ($\sigma_{\Delta n}$)



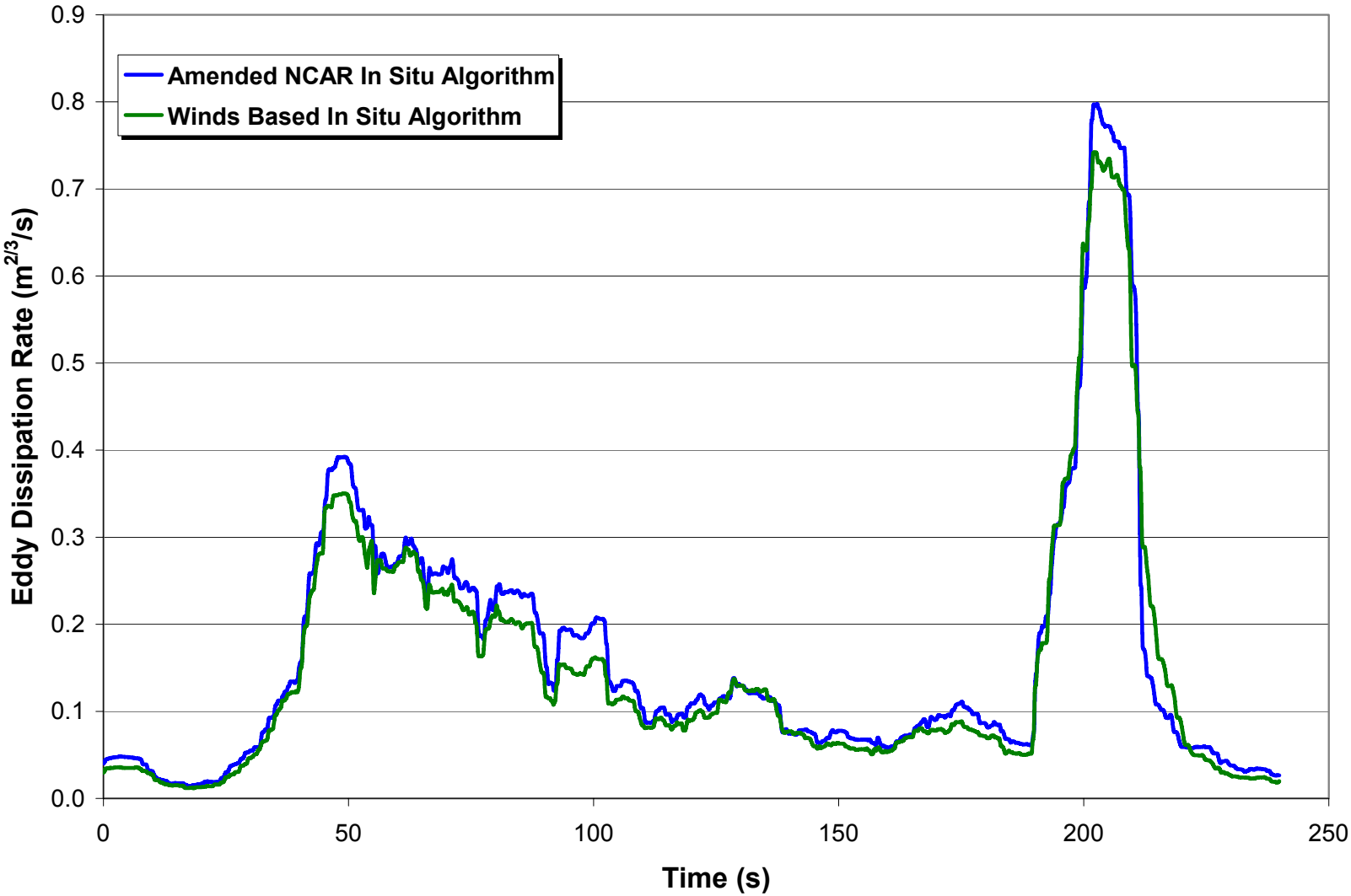
Correlation of Peak Load With Peak RMS Load (5 sec. window)

Based on Measurements for 34 Turbulence Encounter Cases

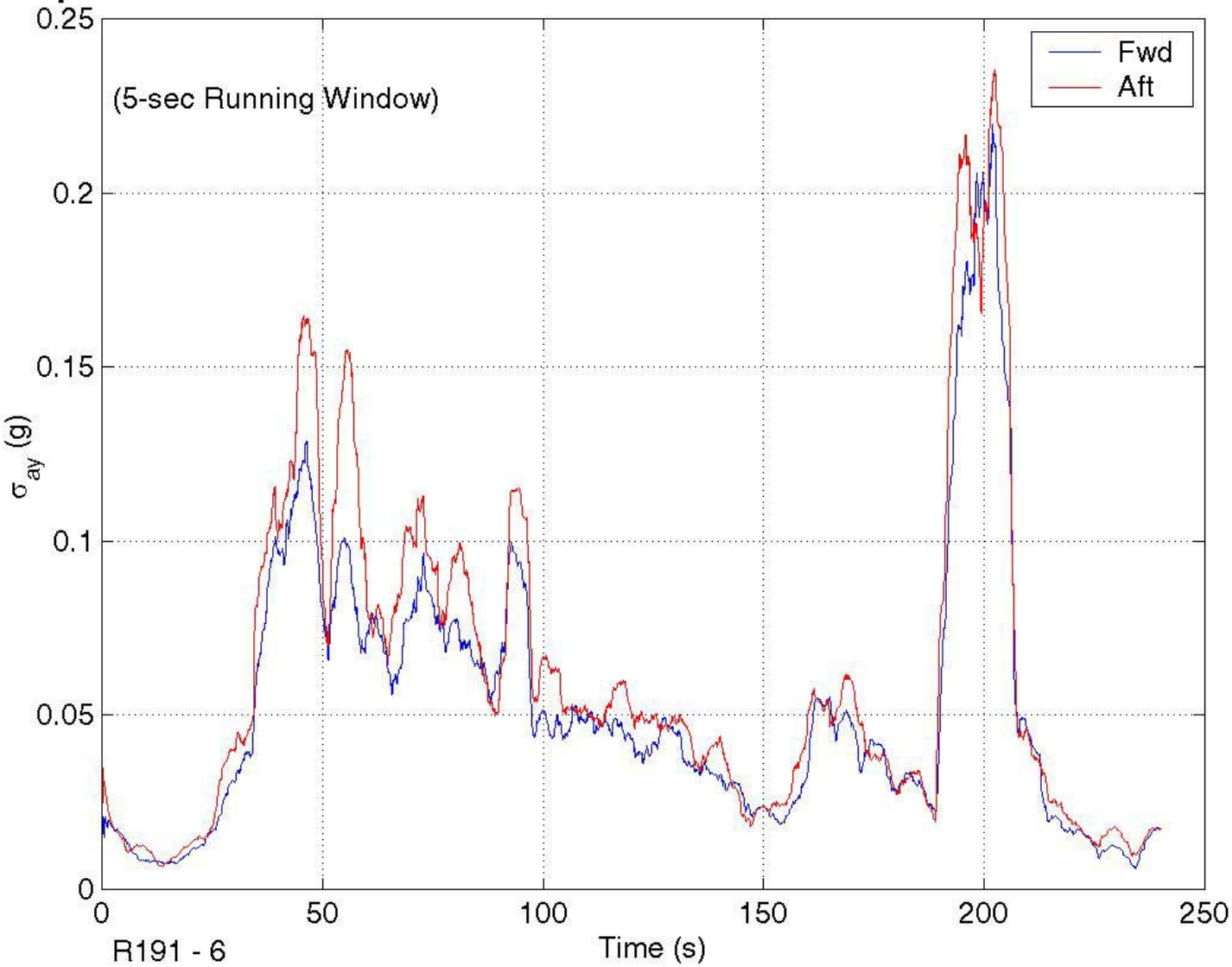


RLB

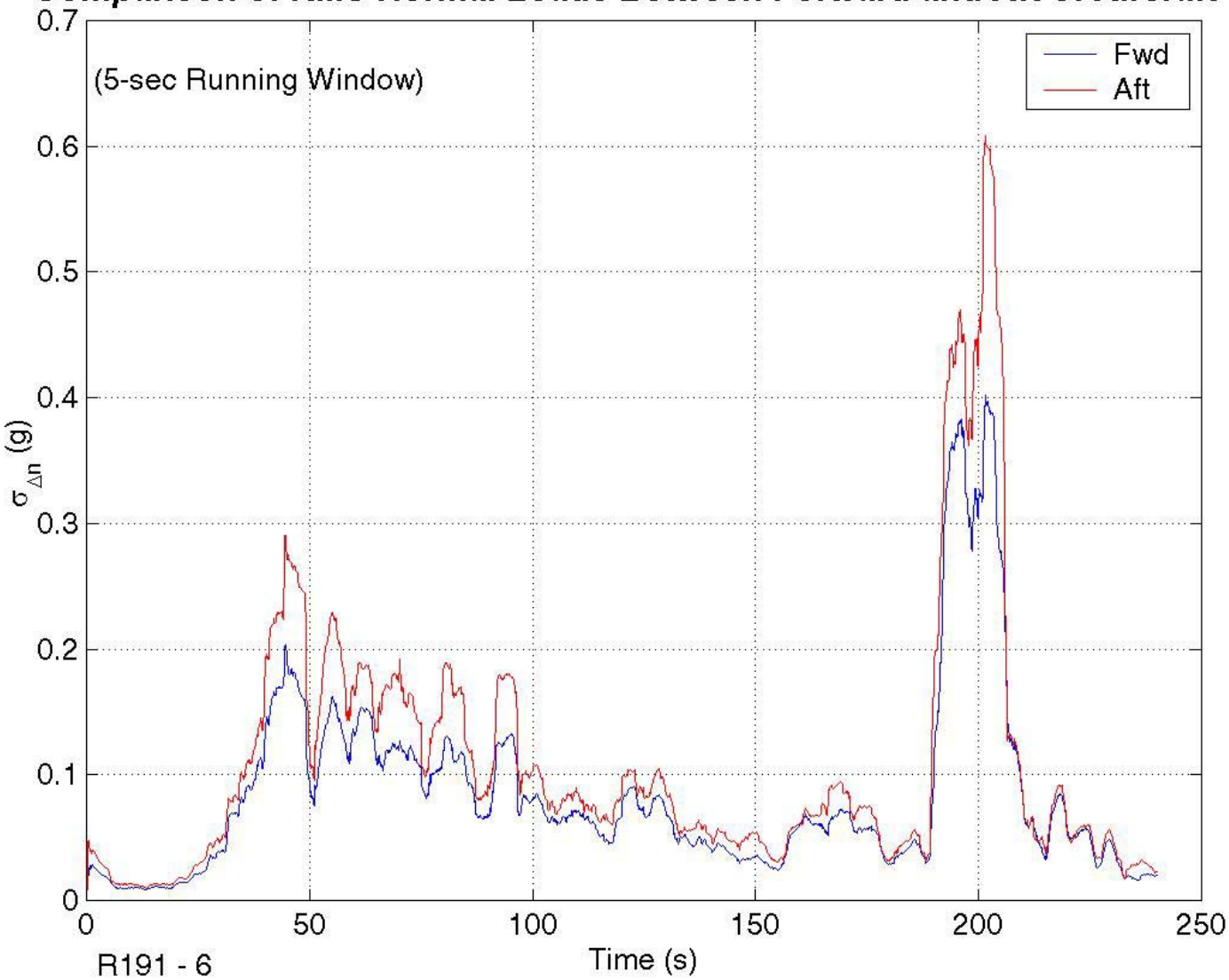
NCAR B-757 Algorithm



Comparison of RMS Lateral Accelerations Between Forward and Aft of Aircraft



Comparison of RMS Normal Loads Between Forward and Aft of Aircraft



Future Work

- Continue flight test of algorithms
- Support fleet implementation of NCAR algorithm
- Continue radar algorithm development support including certification process